

REMARKS

The above-identified patent application has been reviewed in light of the Office Action dated January 29, 2004. Claim 4 has been amended, without intending to abandon or to dedicate to the public any patentable subject matter. Claims 16-20 are new. Accordingly, Claims 1-6, 8-12, 14-20 are now pending. As set out more fully below, reconsideration and withdrawal of the rejections of the claims are respectfully requested.

Initially, Applicants would like to thank the Examiner for the courtesies extended during the telephone interview between the Examiner and the undersigned attorney for Applicants on February 25, 2004. During that interview, the pending rejections of the claims were discussed. No definitive agreement regarding allowable subject matter was reached. However, the Examiner did indicate that claims reciting a narrower range of uniformity coefficients, and that were free from any indefiniteness rejections, would likely be allowable.

Claims 1-6, 8-12, and 14 continue to stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. In particular, the term “about” is found to render the claims indefinite. Applicants respectfully traverse the rejection of the claims as indefinite.

In the present application, the use of the term about does not render the claims indefinite. In particular, the term “about must be given a reasonable scope and be viewed as it would by one of ordinary skill in the art.” *Chemical Separation Tech., Inc. v. United States*, 63 USPQ2d 1114, 1124 (Ct. Cl. 2002) (citations omitted). In the disclosure of the present application, example values for various aspects of filter aids according to embodiments of the present invention are provided. When such values are used to compute the parameters of a filter aid as recited by the

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claims, they are close, but not exactly equal to, values for such aspects of filter aids recited by the claims. Furthermore, the calculated values extend for a number of decimal places. Accordingly, one of ordinary skill in the art would understand that the term “about,” when used in connection with such values encompasses values with at least plus or minus the difference between the exemplary values and the value recited by the claims. Because the use of the term “about” does not necessarily render a claim invalid, and because the usage can be understood in light of the technology embodied in the invention and in light of the disclosure of the application, the rejection of Claims 1-6, 8-12 and 14 as indefinite should be reconsidered and withdrawn. To the extent that an indefiniteness rejection is maintained, Applicants respectfully request that authority for the statement in the Office Action that one of ordinary skill in the art would not be reasonably appraised of the scope of the invention be provided.

Claims 1-6, 8-12, 14 and 15 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,484,620 to Oeschle et al. (“Oeschle”). However, Oeschle does not teach, suggest or disclose all of the claim limitations. In particular, Oeschle does not teach, suggest or disclose particles having the claimed shape factor and uniformity coefficient. Furthermore, it would not have been obvious to one of ordinary skill in the art to produce a filter aid having the claimed attributes in view of Oeschle, as described more fully below.

The invention set forth in the claims is generally directed to a method for filtering an unfiltered liquid. In particular, as recited by Claim 1, a filter aid having individual angular particles is provided. As is further recited by Claim 1, the particles have a shape factor of from about 0.6 to about 0.85, and the population of angular particles is defined by an uniformity coefficient D80/D10 of from 1.8 to about 5. Applicants note that the claimed range for the shape

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factor encompasses the shape factor of the example filter aids in accordance with the present invention, formed from Rilsan RS and Orgasol, set forth in Tables 1 and 2. Furthermore, the claimed range for the uniformity coefficient  $D_{80}/D_{10}$  also encompasses the exemplary embodiments formed from Rilsan RS and Orgasol set forth in Tables 1 and 2. In particular, by dividing the value set forth in the column labeled  $d_{80}$  by the value in the column labeled  $d_{10}$  for each of the Rilsan RS and Orgasol embodiments, it can be appreciated that the uniformity coefficient for those exemplary embodiments falls within the claimed range.

In addition, Applicants note that Claim 15 recites a range of uniformity coefficient of from 1.8 to 5. In addition, new Claims 16-18, which depend from Claim 15, and new Claims 19 and 20, which depend from Claim 1, recite narrower ranges of uniformity coefficient, as compared to the claim from which they depend. Additionally, new Claim 18 also recites a narrower shape factor range. Accordingly, such claims particularly recite aspects of embodiments of the present invention for which unexpected results have been realized, as described in greater detail below. Accordingly, for these additional reasons, Claims 15-20 should be allowed.

Applicants submit that a *prima facie* case of obviousness has not been established. In particular, the reference cited in connection with the rejection under § 103, Oeschle, discusses manufacturing filter aids, and providing a particle size that is suitable for an intended use. However, there is no teaching, suggestion or disclosure in Oeschle of the desirability of using any of the specific characteristics recited by the claims. Instead, Oeschle simply states that particles of various sizes may be manufactured. Furthermore, the Office Action does not provide support for the finding that claimed attributes are result effective variables that are commonly optimized

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in order to obtain a desired filter aid. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established.

As described in the specification, and as illustrated by the data in Tables 1 and 2, the present invention, as exemplified by embodiments of the invention formed from Rilson RS and Orgasol, has much improved characteristics as compared to previously available filter aids (*e.g.*, the filter aids EP0483099, CBL, and DIF BO) set forth in Table 1. Furthermore, a method for filtering an unfiltered liquid that uses a filter aid as set forth in the claims provides unexpected results. In particular, the data set forth in Tables 1 and 2 comparing embodiments of a filter aid in accordance with the claimed invention to prior art filter aids establishes that the claimed filter aid provides substantially improved, unexpected results. Moreover, consideration of the comparative data contained in Tables 1 and 2 of the specification comprise specific data indicating the improved properties of the claimed invention.

The achievement of unexpected results by the claimed invention is confirmed by the Declaration of Dr. J. Hermia, submitted previously. In particular, as set forth in the Declaration, the claimed invention exhibits superior properties and advantages that are unexpected. As also set forth in the Declaration, the comparative data establishes that the claimed invention provides improvements in the observed performance characteristics of the filter aid that are greater than expected. These results, as shown in Tables 1 and 2 of the patent application specification, demonstrate that the specific resistance of filter cakes formed with the claimed filter aid is very much lower than that of prior art filter aids. The extent of the improvement over the prior art provided by the filter aid of the present invention is unexpected, because it was not previously recognized that the use of angular particles having distributed sizes would result in improved

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results as compared to the prior art. Accordingly, the claimed invention provides unexpected results.

In addition, as also set forth in the Declaration of Dr. Hermia, the lower specific resistance provided by a filter aid in accordance with the present invention provides advantages not realized by the prior art. For instance, a filter aid in accordance with the present invention exhibits a smaller increase in pressure in the filter and smaller growth of the filter cake than prior art filter aids, allowing increased filtration times. The increased production lifetime thus provided by the claimed filter aid results in a more efficient filtration process, and reduces costs associated with filtration. In addition to these advantages, the claimed filter aid has met with considerable commercial success.

The Declaration of Dr. Hermia also states that the claimed filter aid has characteristics that are not taught, suggested or disclosed by the prior art. In particular, the angular particles of the present invention are quite different from the spherical or the irregular diatomaceous particles of the prior art. Furthermore, although parameters exist that can be used to describe the shape of the particles of the present invention, that does not lead one of skill in the art to the conclusion that the particular characteristics of the filter aid of the present invention are taught, suggested or disclosed by the prior art. Dr. Hermia's Declaration further states that there is nothing in the prior art that teaches, suggests or discloses particles having the angular characteristics of the claimed invention for use as a filter aid.

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For the reasons set forth above, the rejections of the claims should be reconsidered and withdrawn. The application now appearing to be in form for allowance, early notification of same is respectfully requested. The Examiner is invited to contact the undersigned by telephone if doing so would expedite the resolution of this case.

Respectfully submitted,

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